

Application No.: 10/764,978
Reply to Office Action Dated: 23 March 2006

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REMARKS/ARGUMENTS

Claims 1, 4-14, 16-23, 26-34 and 36-49 are pending in the application. Claims 1, 7-11, 13, 23, 29-31, 33, 39, and 43 have been amended. Claims 1 and 23 were amended to recite active steps of the method and to provide additional clarity. Claims 7-11, 13, 29-31, 33 and 39 were amended to provide correct antecedent basis after the amendments to claims 1 and 23. Claim 43 was amended to more clearly claim a method for reproducing conifers. Claim 39 was also amended to include a comma before "wherein." Claims 46-49 were newly added. Support for the amendments can be found in the claims as originally filed (e.g., claims 1 and 23) and in the definitions on pages 3-4 of the specification. Applicant asserts that no new matter was added by the amendments.

Claim Objections

Applicant has amended claim 39 to include a comma before "wherein."

Rejections under 35 U.S.C. § 112, first paragraph

Claims 1, 4-14, 16-23, 26-34 and 36-45 were rejected as based on a disclosure which was non-enabling. The Examiner notes that the specification describes the starting material as megagametophytes of immature zygotic embryos and describes induction, proliferation and prematuration steps for loblolly pine, Radiata pine and Douglas fir. The Examiner then asserts that "[t]here is no guidance for the reproduction of conifers through somatic embryogenesis in the instant claims." See Office Action, at page 3.

Claims 1 and 23 have been amended to indicate that the claim is drawn to methods of reproducing coniferous somatic embryos by somatic embryogenesis by growing an

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embryogenic culture derived from an explant on a nutrient medium selected from the group consisting of an induction medium, a maintenance medium and a prematuration medium, wherein the nutrient medium comprises a galactose-containing sugar. The resulting embryogenic cultures can then be used in the reproduction of conifers by standard methods known to those of skill in the art. The Examples provided demonstrate the method in three separate conifers, namely the loblolly pine, Radiata pine and Douglas fir. The claims as amended are supported and enabled by the specification.

In addition, the claims clearly indicate that the starting material is an explant which is defined at page 3, lines 12-13 of the specification. The Examples and the specification teach that one type of explant is a megagametophyte of an immature zygotic embryo, which is commonly used by those of skill in the art to generate somatic embryos. Somatic embryos may also be initiated from a mature zygotic embryo, a seedling or a bud from an adult tree. See the definition of somatic embryo at page 4, lines 16-18 of the specification. Therefore, the amended claims which delineate a method of reproducing coniferous somatic embryos by somatic embryogenesis are enabled by the specification.

Rejections under 35 U.S.C. § 112, second paragraph

The Examiner has rejected claims 1, 4-14, 16-23, 26-34 and 36-45 as indefinite.

In particular, claims 1 and 23 were rejected as indefinite because they "fail to recite any active, positive method steps delimiting how reproduction of conifers [is] actually practiced" and the claims are incomplete and unclear because there are no procedures for somatic embryogenesis in conifers." Office Action, at page 3. Applicant has amended claims 1 and 23

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to further clarify that it is the using of a galactose-containing compound as a carbon source in at least one of the recited culture media during the associated step in the process of growing an embryogenic culture for the purpose of somatic embryogenesis that is presently claimed. Claims 1 and 23 and the Examples define procedures for somatic embryogenesis in conifers.

Claims 5, 18, 20, 21, 27, 38 and 41 were rejected as indefinite in their recitation of "about." The Examiner asserts that because about is a relative term it renders the claim indefinite. "The fact that claim language, including terms of degree, may not be precise, does not automatically render the claim indefinite under 35 U.S.C. § 112, second paragraph. *Seattle Box Co., v. Industrial Crating & Packing, Inc.*, 731 F.2d 818, 221 USPQ 568 (Fed. Cir. 1984). Acceptability of the claim language depends on whether one of ordinary skill in the art would understand what is claimed, in light of the specification." MPEP §2173.05(b). In particular, the Federal Circuit has determined that the term "about" does not automatically render a claim indefinite. *W.L Gore & Assoc., Inc. v. Garlock, Ind.*, 721 F.2d 1540, 220 USPQ 303, 316 (Fed. Cir. 1983). Infringement of the claim can be determined by measuring the amount of galactose-containing sugar in the medium.

Claims 5, 20, 27, and 41 each contain the term "less than about." Each of the terms is clear because the claims require at least some amount of galactose in the nutrient medium and less than about the indicated percentage to support infringement. Claim 21 recites that the galactose-containing sugar is between "about 1% and about 6%" of the medium. Infringement can readily be determined by measuring the amount of galactose in the medium and determining if it falls within the indicated range. The term "about" only allows a small amount of flexibility. MPEP §2173.05(b)(A). Finally, claims 18 and 38 require the galactose-containing sugar to be

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"more than about 1% of the nutrient medium" and again infringement can readily be determined by measuring the amount of galactose in the medium and the claims clearly require the presence of galactose in the medium. The term "about" is not inherently indefinite and is not indefinite in this instance because infringement is readily determined.

Applicant has amended claim 39 to address the missing antecedent objection.

Rejections under 35 U.S.C. §102

Claims 1, 5-8, 12, 16-22, 43 and 44 were rejected as anticipated by von Arnold. The Examiner asserts that von Arnold discloses formation of embryonic callus when plant cells were grown in a medium containing 30mM sucrose in which the induction medium was supplemented with between about 1% and about 6% galactose, auxin and cytokinin. Anticipation requires that the reference teach each and every element of the claim. MPEP § 2131. Von Arnold does not anticipate the indicated claims because it does not teach use of galactose in combination with an additional sugar and it does not teach a nutrient medium comprising at least about 1% of a galactose-containing sugar.

The Examiner asserts that von Arnold discloses use of a medium containing 30mM sucrose supplemented with galactose. Although von Arnold does disclose medium containing 30mM sucrose and medium containing 30mM galactose, von Arnold does not disclose a medium containing a combination of more than one sugar as required by independent claims 1, 23 and 43. Table 5, which the Examiner refers to, demonstrates the effect of various carbon sources on the formation of embryogenic callus. The Table clearly indicates that the experiment was performed using only a single carbon source for each data point. Von Arnold does not teach or suggest

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using combinations of sugars, much less a combination including galactose and does not anticipate claims 1, 23, 43 or any claim dependent therefrom.

Von Arnold also does not teach a nutrient medium comprising at least about 1% of a galactose-containing sugar. Claims 18, 21 and newly added claim 48 all require that the nutrient medium comprises more than 1% galactose-containing sugar. Von Arnold discloses use of a medium comprising 30mM galactose (page 235 and Table 5). Based on a reported molecular weight of 180.16, a 30mM solution of galactose would only contain about 0.54% galactose. Clearly, 0.54% galactose is less than the 1% galactose-containing sugar required by the indicated claims. Therefore, for at least this additional reason, claims 18, 21 and 48 are not anticipated by von Arnold.

The Examiner also seems to assert that the recited range of galactose-containing sugar included in the dependent claims is meaningless because the phrase "less than about" is unclear. As argued above in response to the indefiniteness rejection, all of the claims clearly require the presence of a galactose-containing sugar in the nutrient medium. This element can not be read out of the claim.

In addition claim 49 is newly added and requires that the maintenance or prematuration medium comprise a galactose-containing sugar. Von Arnold only discloses use of galactose in induction medium and thus for at least this additional reason von Arnold does not anticipate newly added claim 49.

In view of the foregoing, Applicant respectfully requests that the rejections under 35 U.S.C. §102 be withdrawn.

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Rejections under 35 U.S.C. §103

Applicant respectfully submits that the Office action fails to set forth a *prima facie* case of obviousness with regards to the remaining rejections. A *prima facie* case of obviousness requires: 1) some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify or combine the teachings; 2) a reasonable expectation of success; and 3) the references must teach or suggest all the claimed limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, not in applicant's disclosure. *In re Vaeck*, 947 F.2d 488 (Fed. Cir. 1991).

Claims 1, 4-8, 12, 14, 16-22 and 43-44 were rejected as obvious over von Arnold in view of Schuller and Find. The Office Action asserts that Schuller teaches lactose as a carbon source in the maturation stage of *Abies alba* and that Find teaches galactose and lactose as potential carbon sources in maturation medium. Notably, neither of these references teaches use of galactose or lactose as a carbon source in the induction, maintenance or prematuration media, but only in the maturation medium. Therefore, neither Schuller nor Find cures the deficiencies in the *prima facie* case noted above with respect to von Arnold. In addition, no suggestion or motivation to combine the references was provided and there would be no expectation of success in the combinations suggested by the Examiner. Thus, the rejection should be withdrawn.

Claims 1, 4-9, 12, 16-23, 26-29, 32 and 36-45 were rejected as obvious over von Arnold in view of Vuke. The Office Action asserts Vuke teaches that callus of *Pinea taeda* was able to grow in media supplemented with galactose or lactose. Vuke teaches media and methods for growing non-embryogenic cultures and does not teach or suggest use of similar media for

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growing embryogenic cultures. In addition, Vuke is only concerned with the mass of cells produced in various media and not the embryogenic capacity of the plant cells. One of ordinary skill in the art would not have been motivated to combine the teachings of von Arnold and Vuke because the cultures are distinct. Thus, Vuke does not cure the deficiencies in von Arnold noted above and the combination does not teach or suggest each and every element of claims 1, 23, 43 or any claim dependent therefrom. In addition, no suggestion or motivation to combine the references was provided and there would be no expectation of success in the combinations suggested by the Examiner. Thus, the rejection should be withdrawn.

Claims 1, 5-12, 14, 16-23, 27-34 and 36-43 were rejected as obvious over von Arnold in light of Uddin. The Office Action asserts that Uddin supplements the teachings of von Arnold by teaching methods of reproducing *Pinus taeda*, *Pseudotsuga menziesii* and *Pinus radiata* by somatic embryogenesis with glucose or maltose containing media supplemented with abscisic acid. Uddin does not teach or suggest use of at least 1% galactose-containing sugar or use of a galactose-containing sugar in combination with an additional sugar for induction, proliferation or prematuration of an embryogenic culture. Thus, Uddin does not cure the deficiencies of von Arnold noted above and the combination does not teach or suggest all of the elements of claims 1, 23, 43 or any claim dependent therefrom. In addition, no suggestion or motivation to combine the references was provided and there would be no expectation of success in the combinations suggested by the Examiner. Thus, the rejection should be withdrawn.

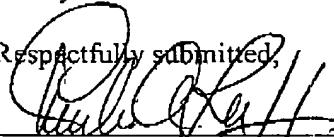
Accordingly, Applicant respectfully requests the withdrawal of the rejections under 35 U.S.C. §103, and allowance of all the claims.

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Applicant respectfully requests that a timely Notice of Allowance be issued in this case.

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Respectfully submitted,


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